Proton Plan Status
September Report

Eric Prebys

Agenda

- Operations Report – Prebys
- Technical Progress – Prebys
- Presentation of Proton Plan Baseline - Sims
- Cost/Schedule Report – Sims

Operations Report

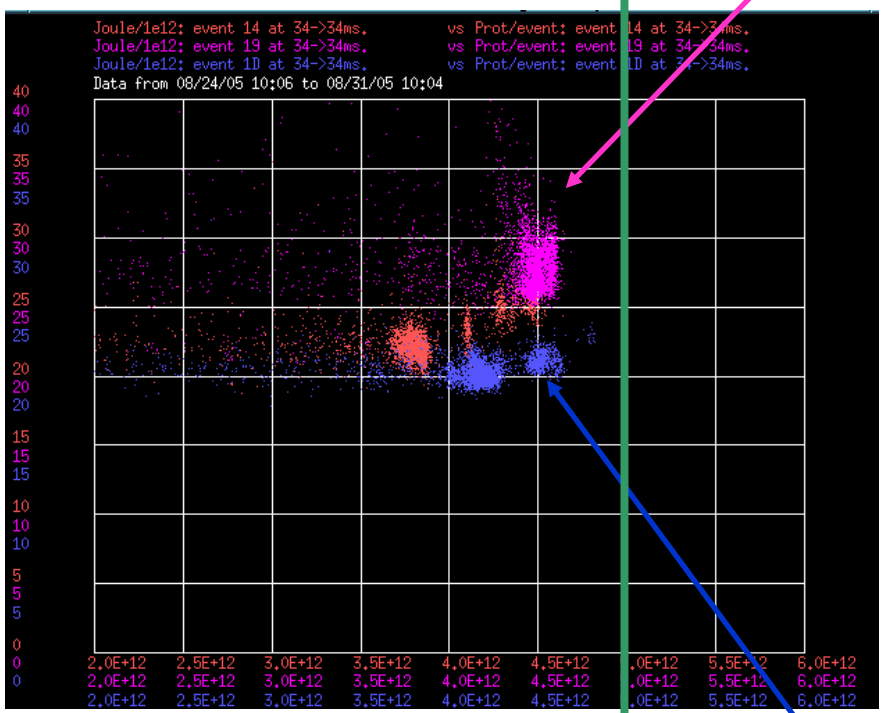
Operational Issues (NuMI)

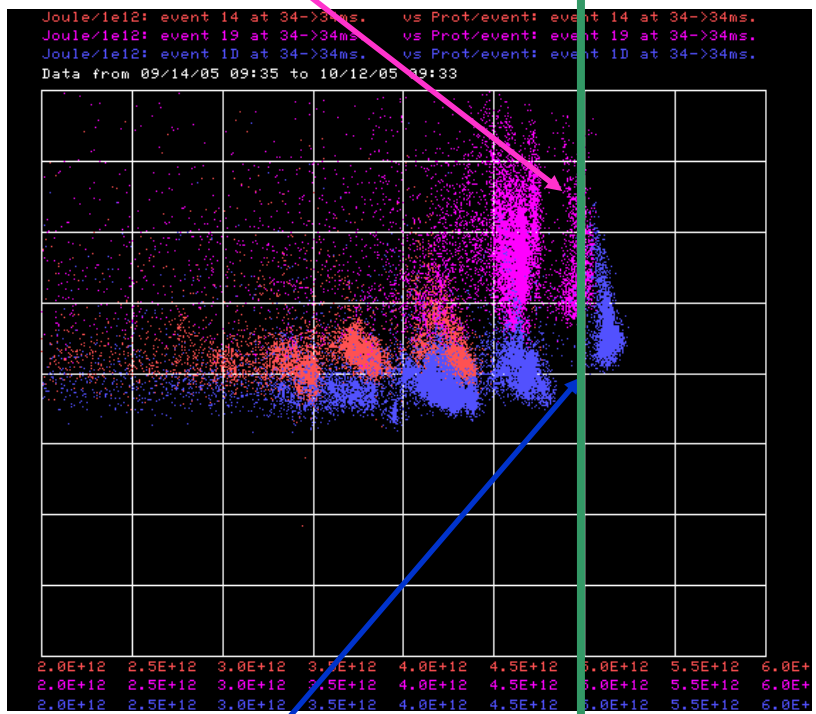
- Implemented interleaved "NuMI only" cycles into standard operation
  - Discussed at last PMG
- Have gone from 5->6 NuMI batches on NuMI only cycles
  - ~5 batches at 2 second rep. rate, as in plan
- Significant improvement in beam loss on high intensity cogged cycles
- Demonstrated 5E12 booster batches to NuMI
  - Just before target problems
- Bottom line:
  - NuMI is pretty much at their goal, until slip stacking (some time after shutdown)

Operational Issues (MiniBooNE)

- Working with operations to formalize Booster tuning procedure to maximize and regularize Booster total output.
- Agreed on MiniBooNE beam monitoring procedure
  - i.e. when to call control room
- Increase MiniBooNE batch size
  - First time extended period >5E12 protons/batch

Total Energy Loss Improvement





Cogged Cycles (NuMI/Stack)

5E12

5E12

Normalized Energy Loss (kJ/E12)

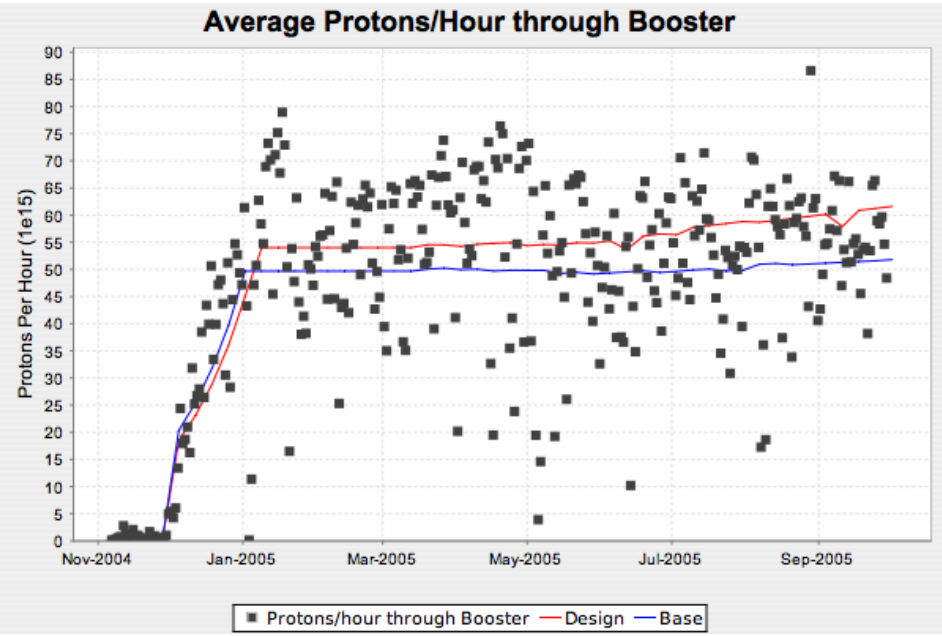
Batch Size

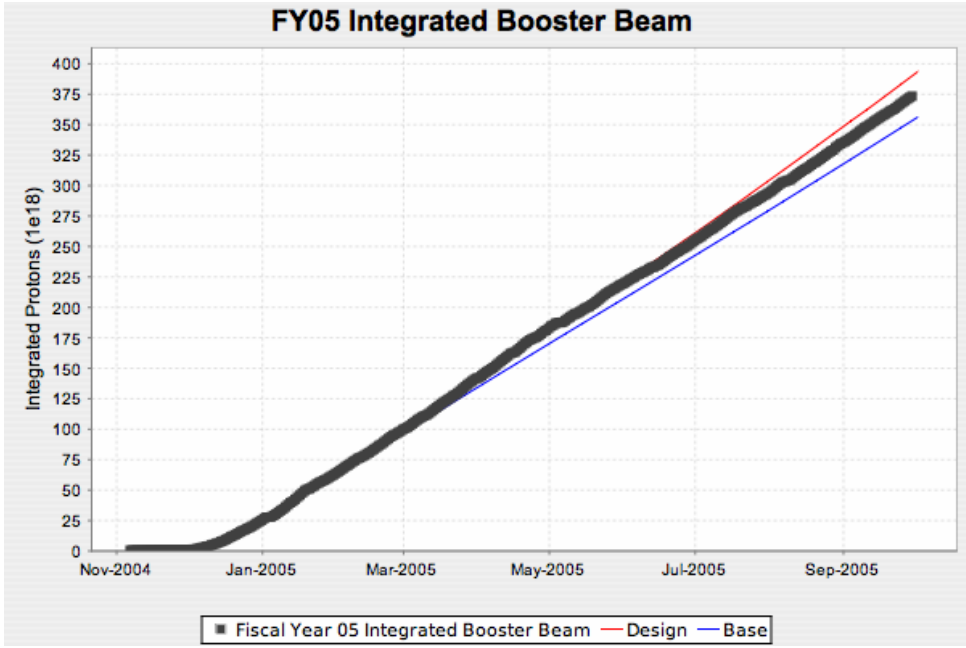
Batch Size

Uncogged Cycles (MB)

FY05 Final (Total Beam)

3.75E20*



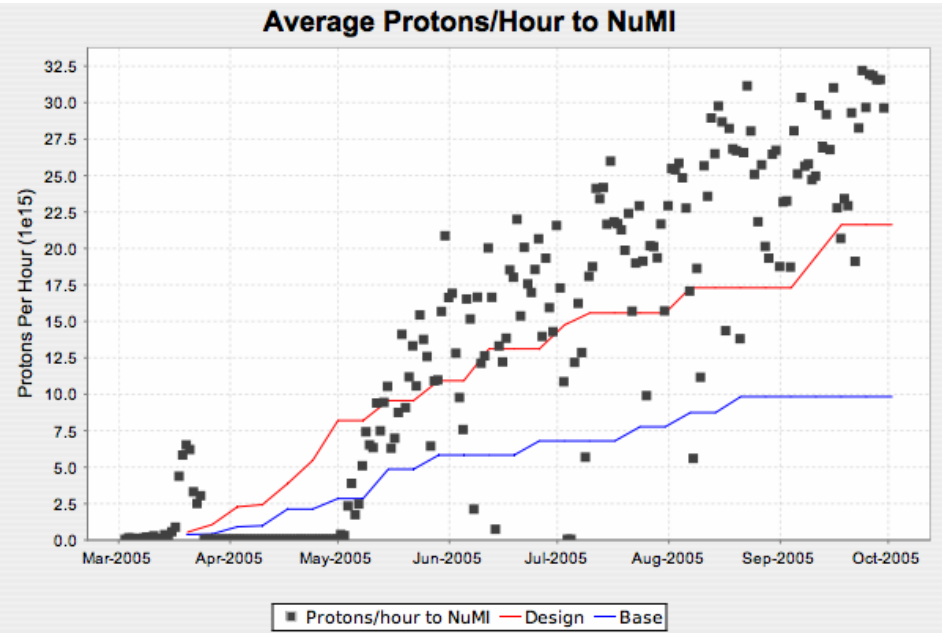


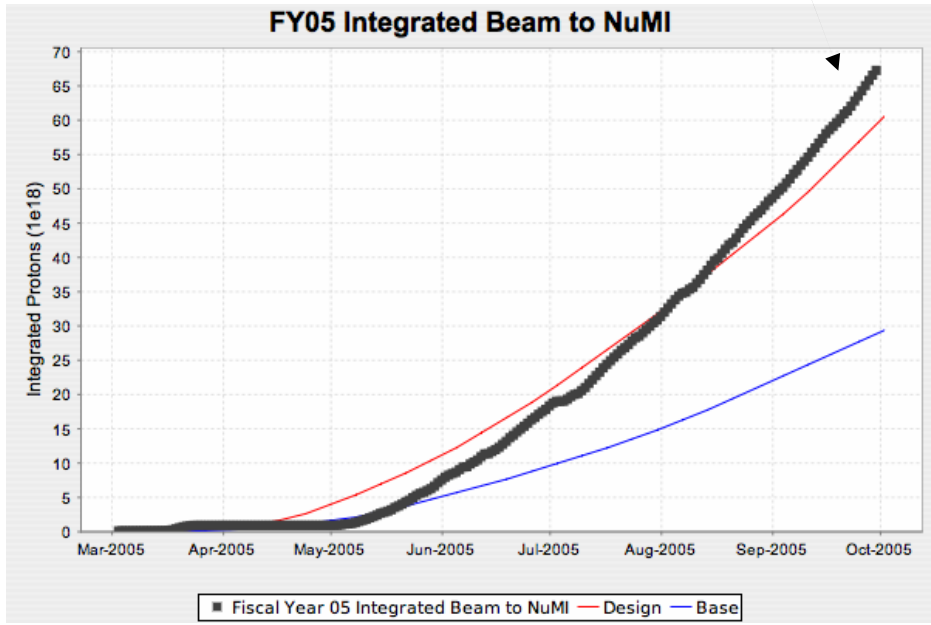
*Total protons in 30 years prior to MB turn on ~5E20

FY05 (NuMI)

Caught up from target problems!

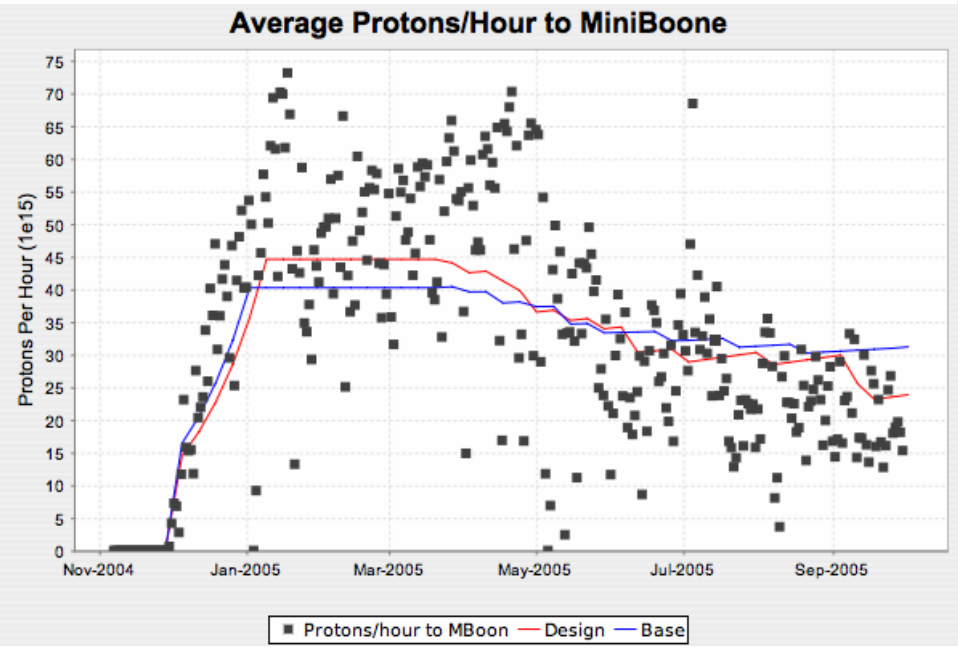
.67E20

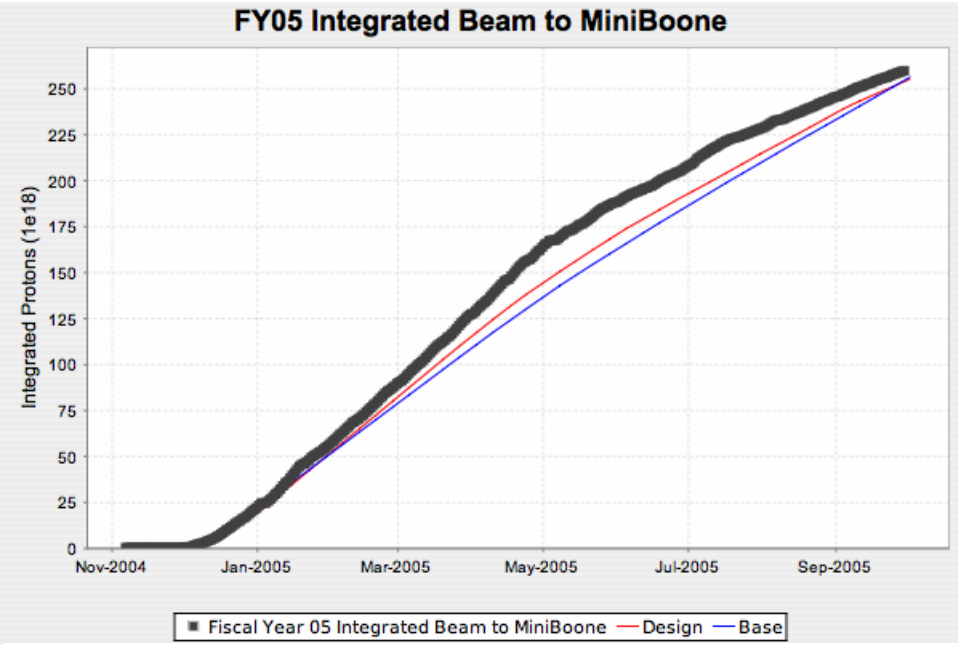




FY05 (MiniBooNE)

2.6E20

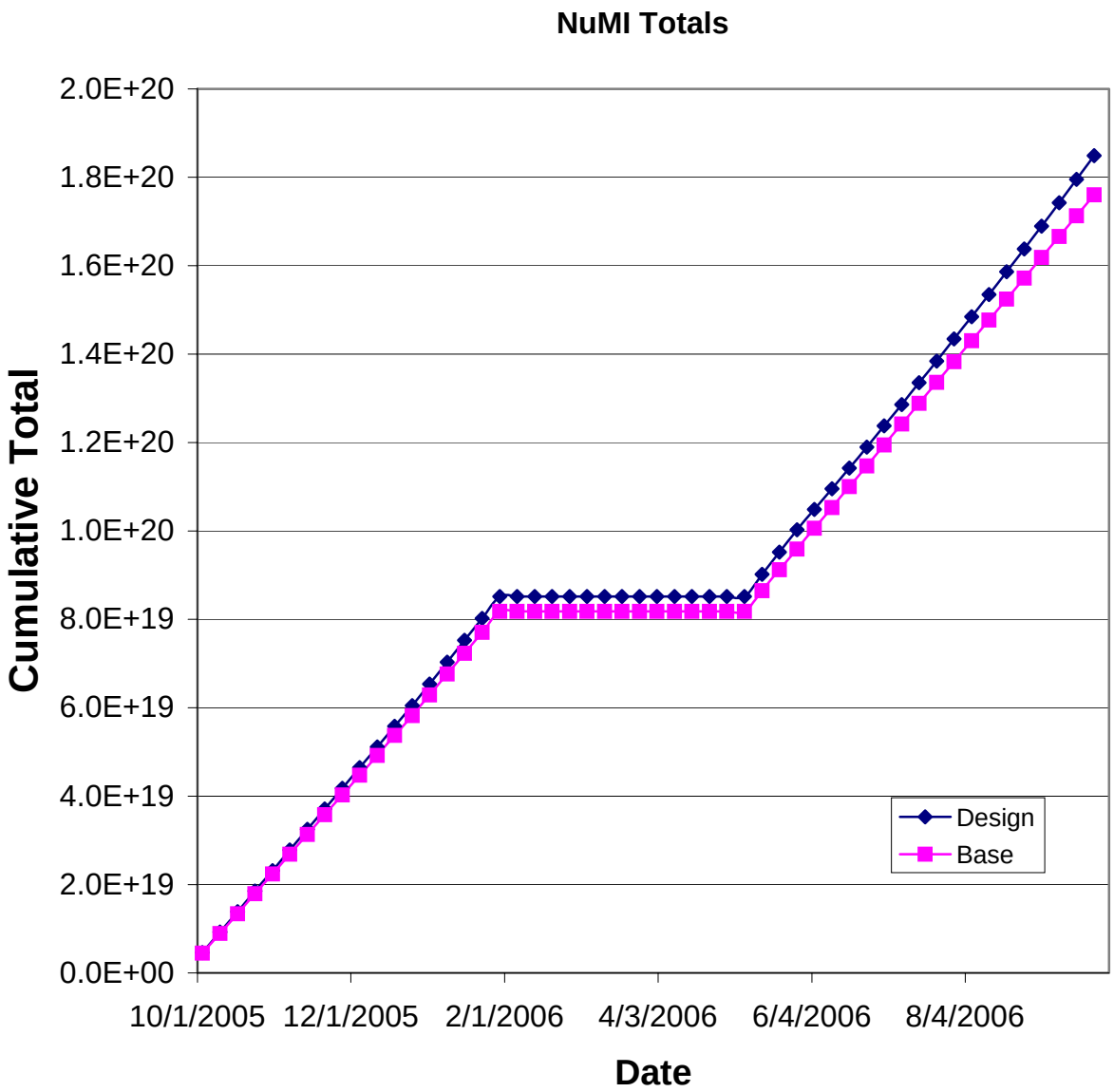




Projections for FY06

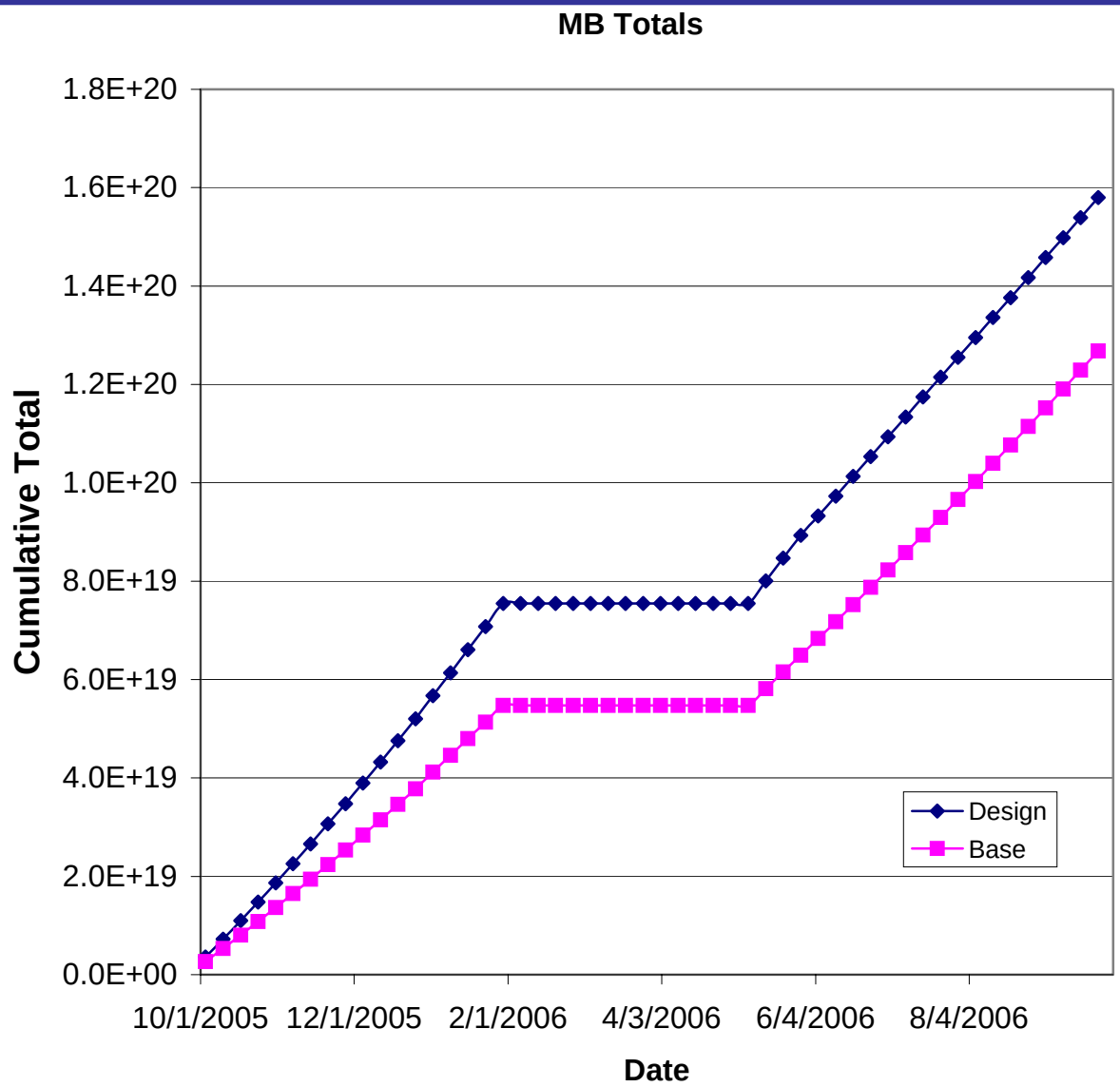
- NuMI
  - Design
    - Gradual increase in batch intensity to ~constant 5E12
    - Begin to implement slip stacking of 1 year following next shutdown
  - Base
    - Run like we are not
- MiniBooNE
  - Design
    - "Design" proton capacity projections from Proton Plan document.
    - NuMI at design.
  - Base
    - "Fallback proton capacity projections from Proton Plan
    - NuMI at Base
- Shutdown
  - Assume beam off for full 14 weeks starting Feb. 6
    - Conservative, not entirely consistent with Plan
    - Projections go up if injector complex stays up.

NuMI Projections

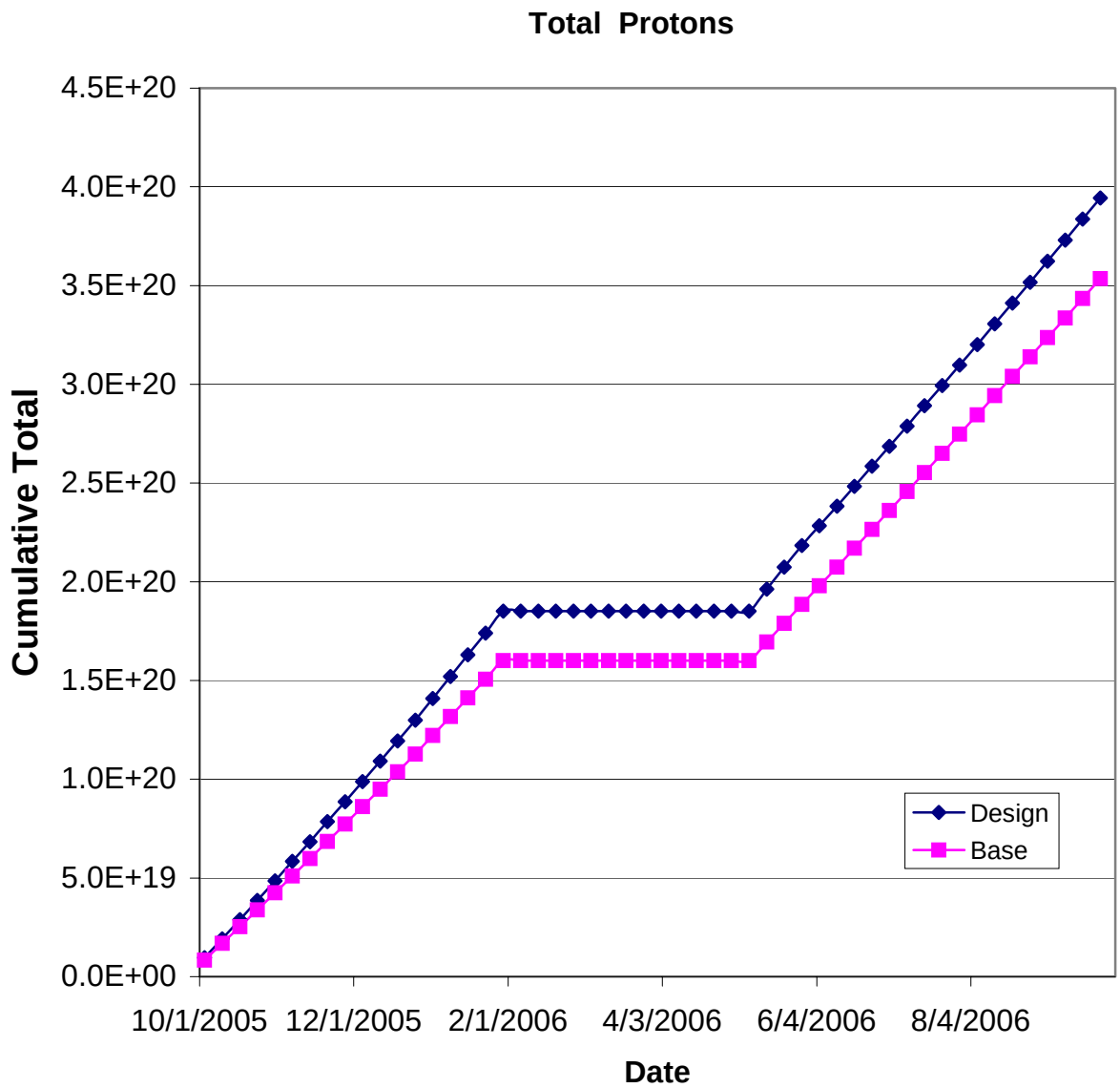


Too close?

MiniBooNE Projections



Total Protons



Technical Progress

General Comments

- Shutdown date still not final
- We can easily move the shutdown tasks themselves to accommodate new shutdown.
- Have not taken into account the affect of the lower priority resulting from delayed shutdown
  - Schedule will show huge float
  - It will look like we're falling behind
  - Not worth chasing a moving target.

Shutdown Preparation

- In general, we are in very good shape for the shutdown.
- Nevertheless, these are big jobs that require a lot of coordination
- We've appointed Rich Andrews "Shutdown Coordinator" for the Proton Plan
  - Primarily an oversight position.
  - Job will be to communicate with Level 2 and 3 managers, as well as support departments to identify problems and help to solve them.

Progress

- Technical Progress

Linac

- 1.01.01 PA Vulnerability –
  - First 2 of 12 new tubes scheduled to be delivered this month.
- 1.01.02 Quad Power Supplies
  - First of seven replacement cards designed
  - Starting on second
- 1.01.04 LLRF Upgrade
  - Working out performance benefit in an effort to increase priority.

Booster

- 1.02.01 Determine rep. rate limit
- 1.02.02 Orbump (+ 400 MeV line) –
  - Finally settled on "no shim" design
  - 5 magnets complete except for endplates and insulators
  - First two ready for testing in 1 to 2 weeks
  - Girder back from vendor
  - 400 MeV design complete
  - World's most detailed ALARA under way.

Progress

Booster

- 1.02.03 Correctors –
  - Design nearing completion for prototype
  - Working out test and QA procedure
  - Final specs will go to EE support within a week or two
  - Broken into two installations
    - Long (verticals) in 2007
    - Short (horizontals) in 2008
- 1.02.11 Booster Dump Relocation
  - Delay caused by need move PS location in Booster West Tower
  - Largest single project in the shutdown
  - Still in good shape
  - Working to reconcile our labor estimates with Dave Augustine.
- 1.02.13 Booster RF/ Rep. rate Improvements
  - 15 Hz transformers have been given increased priority in purchasing to have them ready for installation it the shutdown.

Progress

Main Injector

- 1.03.01 Large Aperture Quads –
  - Planning to install all 7 during shutdown
- 1.03.02 Collimation –
  - MI-8 Design being finalized
  - Long lead times ordered
  - Will go in in shutdown
  - Working on conceptual MI ring collimation
- 1.03.03 NuMI MultiBatch Operations –
  - Regularly deliver 5 or 6 batches Total (>2.8E13)protons to NuMI target
  - Doing prep work to do in tunnel improvements to MI-10 kicker to allow for slip stack operations after shutdown.
  - Added badly needed RF expertise for MI modeling (Tim Barenc)